

Patent Claims

1. A lifting apparatus for transporting a container, said device comprising a main frame and two shuttle booms, wherein respectively one shuttle boom is positioned such that it exits at one longitudinal-side end of the main frame and can be moved in longitudinal direction of the main frame and wherein the free ends of the shuttle booms are provided with holders for attaching the container, characterized in that the shuttle booms (3) and/or the holders are operated by means of an electric drive and that the shuttle booms (3) are guided with roller bearings inside a main frame (2).
2. A lifting apparatus according to claim 1, characterized in that the shuttle booms (3) are made of carbon fiber compound materials or of steel.
3. A lifting apparatus according to one of the claims 1 or 2, characterized in that the electric drive comprises two electric motors (10), wherein each electric motor (10) respectively drives a toothed belt (11), which engages in an energy-supply rod (5) on a shuttle boom (3).
4. A lifting apparatus according to claim 3, characterized in that the shuttle booms (3) have identical designs and are respectively provided with two crossbeams (4), arranged parallel and at a distance to each other, which are guided inside slide-in

compartments (12, 12') of the main frame (2) and between which the energy-supply rod (5) of the respective shuttle boom (3) extends.

5. A lifting apparatus according to claim 4, characterized in that the crossbeams (4) of the shuttle booms (3) are guided respectively displaced to the side inside the main frame (2), wherein a separate slide-in compartment (12, 12') is provided for each crossbeam (4).
6. A lifting apparatus according to one of the claims 1 – 5, characterized in that the roller bearings are provided with rollers (15, 16, 17, 18), the rotational axes of which extend crosswise to the longitudinal axis of the respective shuttle boom (3).
7. A lifting apparatus according to claim 6, characterized in that the rollers (15, 16, 17, 18) are made of polypropylene or rigid expanded polyurethane.
8. A lifting apparatus according to one of the claims 6 or 7, characterized in that the rollers (15, 16, 17, 18) are positioned with springs.
9. A lifting apparatus according to one of the claims 6 - 8, characterized in that the crossbeam (4) back, positioned inside the main frame (2), of each shuttle boom (3), is provided with two opposite-arranged rollers (15, 16) on the crossbeam (4), wherein the first roller (15) projects over the top surface of crossbeam (4) and the second roller (16) projects over the underside of crossbeam (4), so that these

27. A lifting apparatus according to claim 26, characterized in that each linear drive (37) comprises a primary component (38) that is positioned stationary at the slide-in compartment (12, 12') associated with the crossbeam (4) and a secondary component (39) in the form of a metal rail, which extends in longitudinal direction of the respective crossbeam (4).
28. A lifting apparatus according to claim 27, characterized in that each secondary component (39) extends over the complete length of a shuttle boom (3).
29. A lifting apparatus according to one of the claims 27 or 28, characterized in that the surfaces of the primary component (38) and the secondary component (39), which are facing each other, are kept at a constant distance to each other by means of roller spacers (43).
30. A lifting apparatus according to claim 29, characterized in that the rollers spacers (43) form a part of the roller bearings.
31. A lifting apparatus according to one of the claims 25 - 30, characterized in that a securing device is provided for fixing a shuttle boom (3) in a predetermined displacement position.

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40. A lifting apparatus according to claim 39, characterized in that the energy-supply rod (5) has a top side and an underside, on which the drums (45) of a drum motor (44) can respectively roll off.
41. A lifting apparatus according to one of the claims 39 or 40, characterized in that a friction lining is installed on the outer surface of the drums (45) of drum motors (44).
42. A lifting apparatus according to claim 41, characterized in that the friction lining consists of a wear-resistant rubber material or a glass-fiber containing plastic casting compound.
43. A lifting apparatus according to one of the claims 40 – 42, characterized in that a friction lining is applied to the top side or underside of each energy-supply rod (5).
44. A lifting apparatus according to one of the claims 39 - 43, characterized in that the drums (45) of drum motors (44) are pushed with spring tension against the energy-supply rod (5).
45. A lifting apparatus according to one of the claims 39 - 44, characterized in that the walls of the shuttle booms (3) have a lattice-type design, at least in some sections.

51. A lifting apparatus according to claim 50, characterized in that each spring leaf (49) is positioned between two spring retainers (50).
52. A lifting apparatus according to one of the claims 50 or 51, characterized in that the shuttle booms (3) are provided with crossbeams (4) that are guided inside slide-in compartments (12, 12'), wherein the spring leaves (49) are arranged on the undersides of the slide-in compartments (12, 12').
53. A lifting apparatus according to claim 52, characterized in that flat support elements (52) for guiding the crossbeams (4) of shuttle booms (3) are provided on the inside walls of the slide-in compartments (12, 12').
54. A lifting apparatus according to claim 53, characterized in that the support elements (52) are arranged in pairs on opposite insides of the slide-in compartments (12, 12').
55. A lifting apparatus according to one of the claims 53 or 54, characterized in that the support elements (52) are made from plastic.